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Surface Mine Countermeasure Unmanned Undersea Vehicle (SMCM UUV) Acquisition Plan

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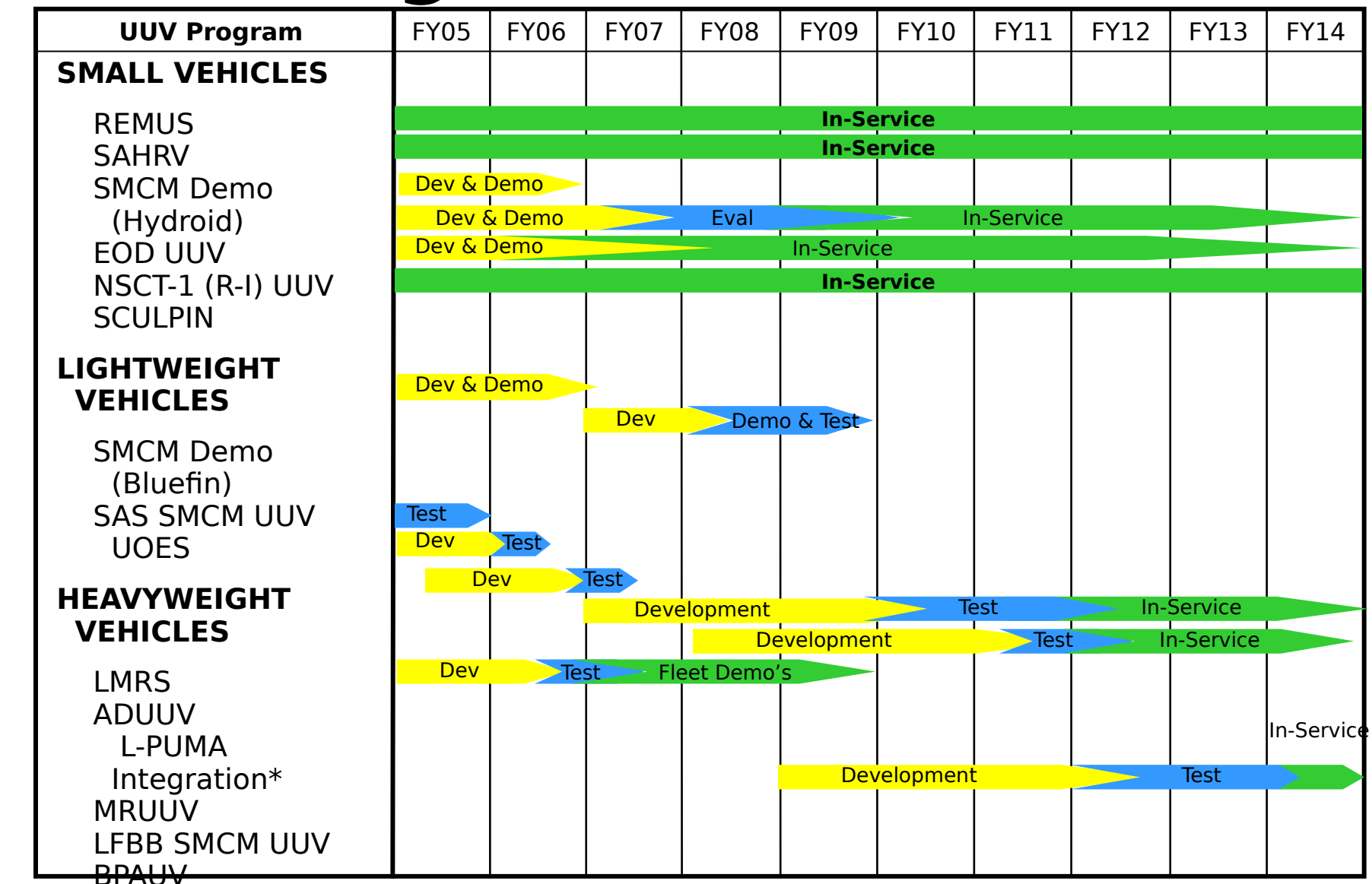
UUV Master Plan:

Four Vehicle Classes Satisfying Nine Capability Areas

Class	Displacement (lbs)	Endurance High Hotel Load (hours)	Endurance Low Hotel Load (hours)	Payload (ft^3)
Man Portable 3”-9” dia.	<100	<10	10-20	<0.25
LWV ~12.75” dia.	~500	10-20	20-40	1-3
HWV ~21” dia.	<3000	20-50	40-80	4-6
[illegible]	~20,000	100-300	>>400	15-30 + external stores

Seapower Pillar	Priority	Sub Pillar Capability	Man Portable	LWV	HWV	Large
FORCEnet	1	Intelligence, Surveillance, Reconnaissance	Special Purpose	Harbor	Tactical	Persistent
	5	Oceanography		Special Purpose	Littoral Access	Long Range
	6	Communication / Navigation Network Nodes	VSW / SOF	Mobile CN3		
Sea Shield	2	Mine Countermeasures	VSW / SW SCM / RI Neutralizers	OPAREA Clearance	Clandestine Recon.	
	3	Anti-Submarine Warfare				Hold-at-Risk
	4	Inspection / ID	HLD/ATFP			
Sea Base	7	Payload Delivery				SOF, ASW, MCM, TCS**
Sea Strike	8	Information Operations		Network Attack	Submarine Decoy	
	9	Time Critical Strike				(see Payload Delivery)

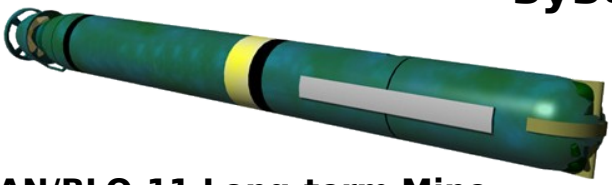
UUV Development Programs



* Assumes execution of proposed L-PUMA integration with ADUUV

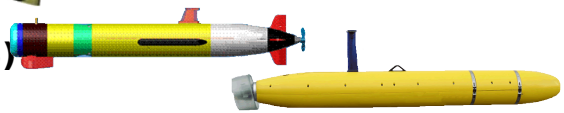
PMS 403 UUV Programs

Mission: Develop, acquire and maintain operationally superior and affordable Unmanned Undersea Vehicle systems for the Warfighter.



AN/BLQ-11 Long-term Mine Reconnaissance System (LMRS)

- Torpedo Tube Launch and Recovery
- Clandestine Mine Counter-Measures

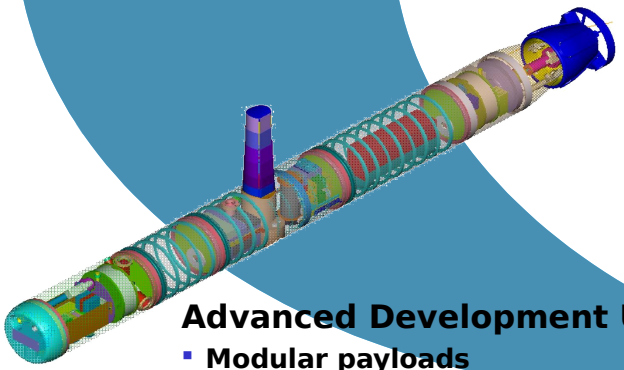


BPAUV/ SMCM UUV

- Surface Launch and Recovery
- Affordable MCM search and localization capability
- LCS Flight 0
- Direct leverage of ONR investment

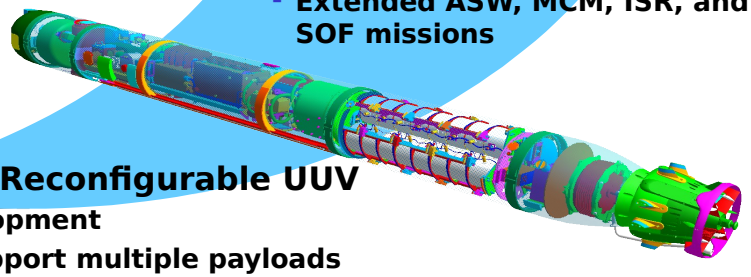
Large Displacement MRUUV

- Future development
- Improved range and payload capability vs 21” UUV
- SSGN, VIRGINIA, Littoral Combat Ship compatible
- Modular open systems architecture
- Extended ASW, MCM, ISR, and SOF missions



Advanced Development UUV

- Modular payloads
- Technical risk reduction
- Test-bed for future payloads



21” Mission Reconfigurable UUV

- Future development
- Modular - support multiple payloads
- Payload reconfigurable MCM, ISR and other missions

Navy Unmanned Vehicle Standardization

1. Unmanned Systems C2 / Interoperability Standards

- Addresses Common Control Systems, Open Interface (API) Standards (XML), and JAUS & STANAG 4586 joint / Coalition interoperability standards

2. Unmanned Systems C4I Communications Standards

- Coordinated with Navy C4I Roadmap
- Addresses Forcenet / GIG Compliance (includes Undersea Forcenet)
- Pursues common radios & antennas and IP-based networking
- Pursue in Concert with PEO(C4I)

3. Unmanned Vehicles Size / HM&E / Payload Modularity Standards

-Start with UUVs - leverage past progress by UUV Program Office (PMS 403)
-Includes addressing potential standards for autonomy
-Engage with AUVSI and ASTM to develop industry standards

4. Open Architecture Standards

- Address open architecture interfaces to combat systems
- Computing Environment and functional architecture standardization focus
- Pursue in Concert with PEO(IWS)

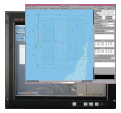
Navy Unmanned Vehicle Standardization Guidance to Industry

- **Responsibility of UV Developers to Furnish Compliant Vehicles**
- **Minimize Changes to Onboard C2 Architecture When Adding New**

Bring New Unmanned Vehicles Onboard ..... But Avoid Bringing a New C

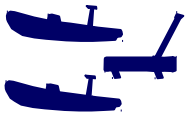
UAVs

NATO STANAG 4586 Messaging Standard



Generic STANAG 4586 Compliant Common UA Control Station (CUCS) (in UVCC)

USVs



JAUS (SAE AS-4) Messaging Standard

Generic JAUS/SAE AS-4 Compliant Common US Control Station (in UVCC)

UUVs

(Emergent as JAUS is Updated to Addess UUV Requirements)

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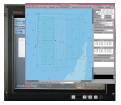
Generic JAUS/SAE AS-4 Compliant Common US Control Station (in UVCC)

UGVs

JAUS (SAE AS-4) Messaging Standard



Generic JAUS/SAE AS-4 Compliant Common US Control Station (in UVCC)

… Legacy UVs Need to Develop a P3I Strategy/Plan to Become Compli

UUV Standardization Key Focus Areas Engagement with AUVSI and ASTM

- **Autonomy/Vehicle Control Architecture**
  - **Combination of ASTM Autonomy Guideline & JAUS Standard for C&C**
- **Communication**
  - **Combination of Industry Standards and Government ICD's; intent is to follow ForceNet & Undersea ForceNet Compliance**
- **Mission Payload**
  - **Government ICD's will be used**
- **Launch & Recovery**
  - **Government ICD's will be used**
- **Power Distribution**
  - **Combination of Industry Standards and Government ICD's**
- **Underwater Connectors**
  - **Industry Standards**
- **CPU Backbone**

Surface MCM UUV Acquisition

Increment 1: Sidescan User Operational Evaluation Systems

- Contracts awarded FY04
- Deliveries/Vehicle Acceptance Tests in August/September 2005
- To be operated by COMINEWARCOM UUV Platoon FY06-FY07 to determine tactics and evaluate the utility of UUVs in conjunction with other Mine Warfare systems

Surface MCM UUV Acquisition

Increment 2: Dual Frequency Synthetic Aperture Sonar

- Requirements based on ONR 12.75” UUV dual frequency synthetic aperture sonar technology development with input from Requirements Working Group
  - HF provides high resolution images at longer range
  - LF penetrates bottom for detection of buried mines
- Procures 3 systems of 2 UUVs and support equipment
  - Host platform will be MCM class ships and Crafts of Opportunity
  - Supported as User Operational Evaluation Systems (UOES) until FY11
- Option for 6 additional vehicles for PMS EOD
- Plan to issue the RFP Nov 2005

Surface MCM UUV Acquisition

Increment 3: Buried Mine Detection Capability

- Requirements based on ONR/NRL Low Frequency Broadband (LFBB) technology development with input from Requirements Working Group
  - Provides long range mine detection
  - Low frequency band provides deeper ground penetration to detect buried mines than other ONR SAS sensors
- Procures systems of 2 UUVs and support equipment
- Host platform will be LCS class ships, other crafts of opportunity, and pierside
- Current plan is to issue the RFP Nov 2007
  - Program will be initiated with other sensor technology

Surface MCM UUV Acquisition Schedule